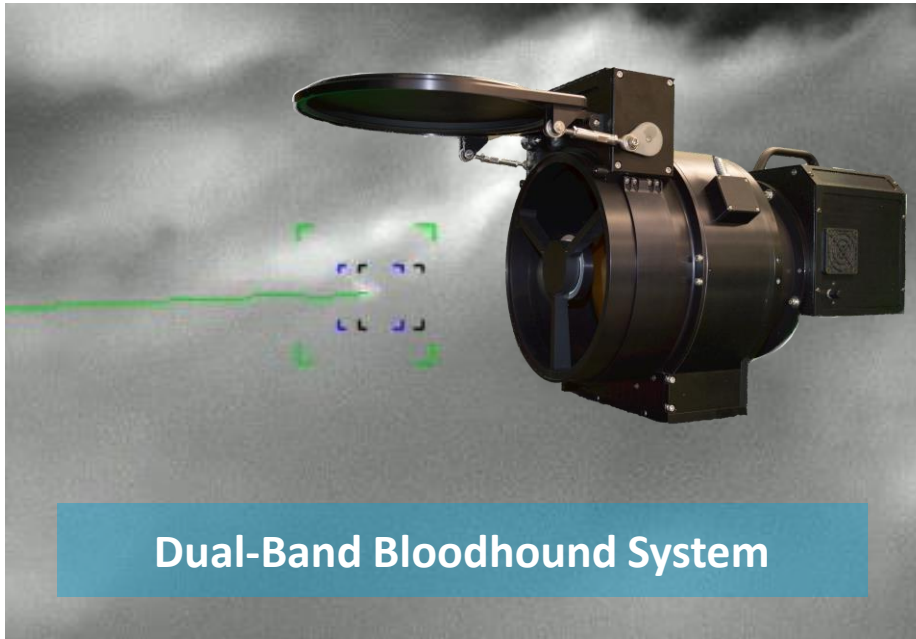


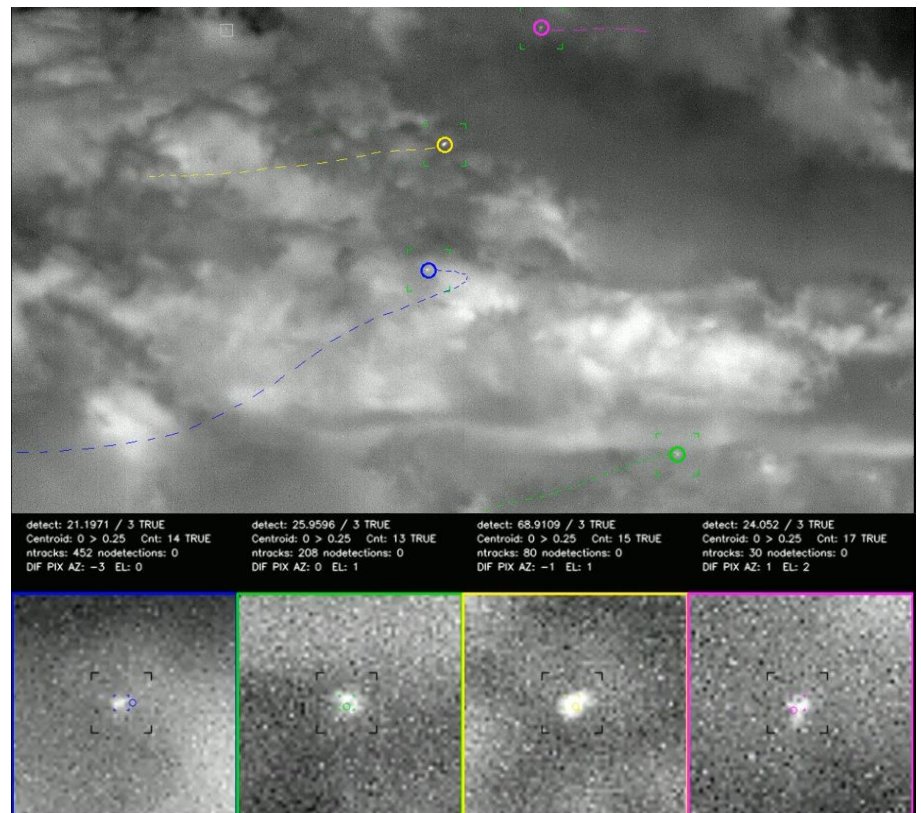
Acquisition and Tracking Sensor



Dual-Band Bloodhound System

The Bloodhound tracker software is used in a next generation acquisition and tracking sensor (ATS) for applications such as high-energy laser kill weapon systems, counter cruise-missiles, C-UAS, or C-RAM (Rockets, Artillery, Mortar). Bloodhound uses a dual waveband, Mid-Wave InfraRed (MWIR) and Long-Wave InfraRed (LWIR), HD focal plane array for optimal operation during the day and night. It works whether the sky is clear or there are lower visibility conditions.

In clear sky conditions, Bloodhound tracking relies on the MWIR waveband where track robustness and acquisition range are optimal. In haze, fog, clouds, and rain, it operates in the LWIR waveband. The tracking software allows tracking against complex backgrounds such as terrain and clouds. The software can now track up to 4 objects at one time. The figure to the left shows it in action. It is able to effectively discriminate between the objects as they cross each other's paths.



detect: 21.1971 / 3 TRUE
Centroid: 0 > 0.25 Cnt: 14 TRUE
ntracks: 452 nodetections: 0
DIF PIX AZ: -3 EL: 0

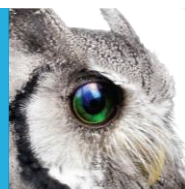
detect: 25.9596 / 3 TRUE
Centroid: 0 > 0.25 Cnt: 13 TRUE
ntracks: 208 nodetections: 0
DIF PIX AZ: 0 EL: 1

detect: 68.9109 / 3 TRUE
Centroid: 0 > 0.25 Cnt: 15 TRUE
ntracks: 80 nodetections: 0
DIF PIX AZ: -1 EL: 1

detect: 24.052 / 3 TRUE
Centroid: 0 > 0.25 Cnt: 17 TRUE
ntracks: 30 nodetections: 0
DIF PIX AZ: 1 EL: 2

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The key technology is the strained super lattice (SLS) focal plane that has broadband sensitivity and can change waveband in a single frame time with a voltage bias change. Technology for next generation larger format SLS cameras for Bloodhound are emerging that will operate with digital ROICs to extend performance and acquisition range. This next generation is, as of yet, unfunded but shows great promise. The comparison of specifications between the current generation and the next generation are below.

Parameter	Current Specs	Next Gen Specs
Waveband	3.7 – 5.1 μ m	7.5 – 10.4 μ m
Pixel Format	1280 × 720	2048 × 2048
Pixel Pitch	12.0 μ m	10.0 μ m
Frame Rate	60 Hz	100 Hz
f/#	2	4
Objective Focal Lengths	500mm	1000mm
FOV	1.7° × 1.0°	1.2° × 1.2°
Clear Sky Mode	MWIR operation	
Haze, Fog, Clouds, Rain	LWIR operation	
Gimbal Rates	0 – 50°/s	
Pointing Accuracy	± 24 μ rad	± 10 μ rad
NeDT	28mK MWIR/LWIR	12mK MWIR/LWIR
Maximum acquisition range 3m object 10C temperature delta	25km	65km
Track mount specs	50°/s velocity; 50°/s/s acceleration	

